



METHOD STATEMENT

EVALUATION AND PREPARATION OF SURFACES FOR FLOORING SYSTEMS

MAY 7th, 2019 / VERSION 1.2 / SIKA SERVICES AG / HENRY HEINRICH

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Method Statement

Evaluation and Preparation of Surfaces for Flooring Systems

May 7th, 2019, Version 1.2

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Language/Region/Translation

e.g. template for local adaption

1 SCOPE

This method statement describes the systematic procedures and methods for the investigation and evaluation of concrete surfaces. Furthermore, the state-of-the-art surface preparation methods are introduced and briefly explained. The aim of this summarized information is to ensure an optimally prepared concrete surface for the proper laying and use of floor coverings from the Sikafloor® range.

2 SURFACE EVALUATION

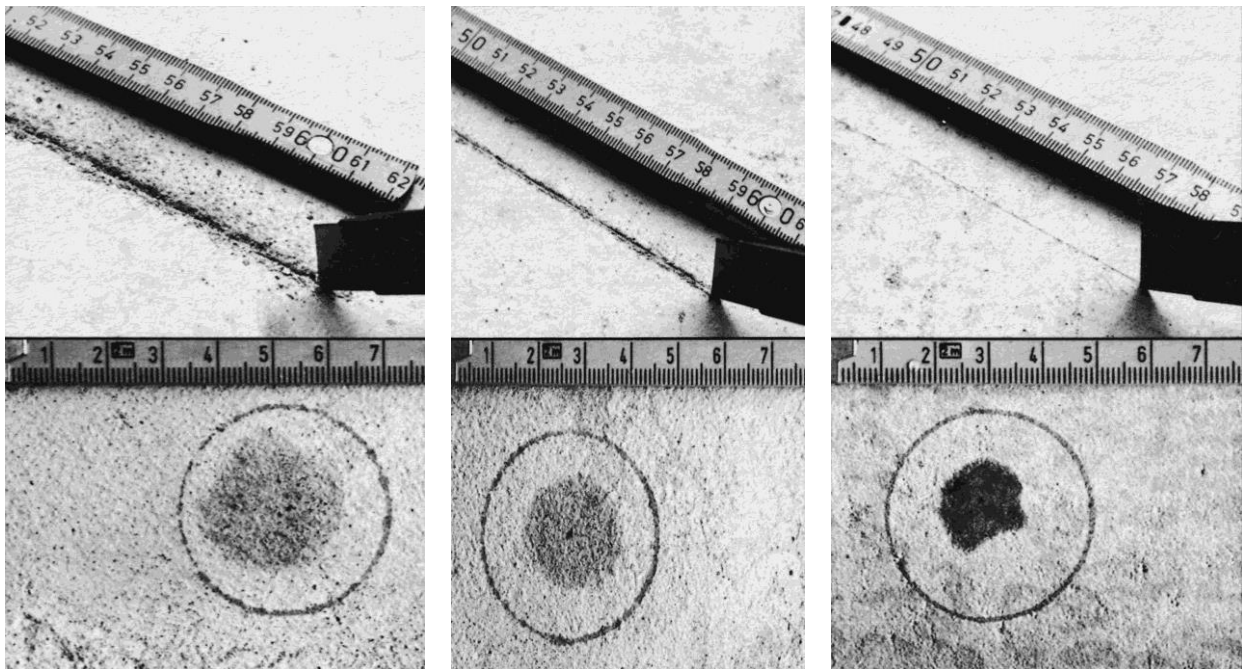
The first step towards surface preparation is to thoroughly evaluate the given surface. In order to obtain all required information, different methods can be applied.

2.1 VISUAL INSPECTION

This is a quick method to determine various kinds of pollution, surface defects such as cracks etc.

2.2 SCRATCH AND ABSORBING TEST METHOD

A simple test that can be carried out on the construction site is the scratch test. The surface to be treated is scratched with a knife, spatula or screwdriver. If the substrate has poor cohesion respectively strength, the tested material splinters off.



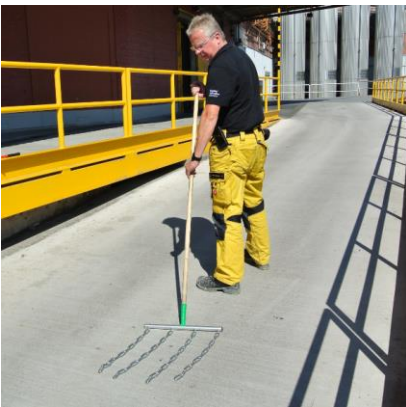
The wetting or absorption test can be used to assess the absorbency and strength and adhesion in a wetted state. The results obtained from the wetting test play an important role in the selection of surface preparation and the coating build-up.

2.3 HAMMER SOUNDING



Hammer Sounding allows you to determine the presence of delamination, overlay bonding problems, etc.

2.4 CHAIN DRAGGING METHOD

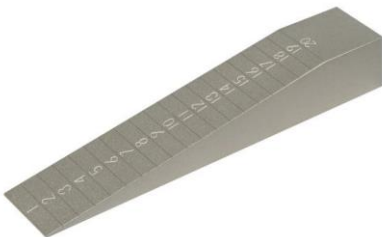


The Chain Dragging Method (ASTM D4580) is used to sound out delamination. Normal, solid bonded concrete has a dull sound when chain dragged. When delamination is found, the pitch of the sound rises (hollow sound) due to reduced thickness of the solid concrete.

2.5 EVENNESS OF CONCRETE SUBSTRATES



With regards to DIN 18202 Sika recommends that the deviation of the evenness of concrete substrate, before the application of a floor material, must be < 10 mm calculated on a length of 4 m. (DIN 18202 "Tolerances in building construction"; Page No. 9; Table No. 3 "Limits for the deviation of evenness"; Line No. 3.)



For the measurement, one needs a straightedge of aluminium or steel and a Measuring Wedge.

Per insertion of the wedge between concrete and straightedge, the unevenness can be read immediately. The measuring wedge is made of metal; the scale, 1 to 20 mm, is engraved on the surface.

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3 SUBSTRATE REQUIREMENTS

3.1 SURFACE TENSILE STRENGTH

Good bond strength between the overlay and the substrate is a key factor in performance of our Sikafloor®- Floor coverings.

The substrate must be sound and of sufficient compressive strength (minimum 25 N/mm²) with a minimum pull off strength of 1.5 N/mm². The substrate must be clean, dry and free of all contaminants such as dirt, oil, grease, coatings and surface treatments, etc.

Please note:

- When low loads can be expected (e.g. offices, residential houses) often lower strength substrates are used (e.g. cement or calcium sulfate screeds), the average pull-off strength must be 1.2 N/mm². Lowest acceptable of any readings must be 1.0 N/mm². The pull-off measurement can also be carried out after priming with a PUR or epoxy primer.
- When the self-leveling compounds Sikafloor®-200 Level, Sikafloor®-300 Level, Sikafloor®-300 Rapid Level and Sikafloor®-400 Level will be overcoated with specific coating build up, please refer to PDS, this can lead to a pull-off values of minimum 1.0 N/mm².
- Sika takes no responsibility about the screed design and quality. The screed quality needs to comply with the demands and loads in this particular building. This includes also appropriate waterproofing to prevent in case of the use of a calcium sulfate screed from expanding or swelling.
- The laitance needs to be removed by sanding followed by proper vacuum cleaning to remove the dust out of the pores.
- For very porous substrates (e.g. calcium sulfate screeds) it is recommended to apply at least two coats of an epoxy primer, e.g. with Sikafloor-156, if circumstances require in order to achieve a pore-free substrate. Applying an additional scratch coat of Sikafloor®-156, filled with quartz sand and Extender T, is a suitable measure to fill and close the pores.
- For all other kind of substrates, please contact your local technical service department.



The below mentioned procedure is based on the European Standard EN 1542.

Short description for the evaluation of the bond strength:

- Drill in a depth of 15-20 mm by using a core driller, which is equipped with a diamond-drilling core.
- Apply a thin layer of Sikadur®-31 on the surface and on the dolly and press the dolly firmly onto the surface. Allow the adhesive to cure for min. 24 h
- Carry out the pull-off test in accordance to the manufacturer's instructions. Ensure that the dollies are loaded in direct tension without bending. Pull-off speed: 100 N/s.

Suitable pull-off tester: Pull-off tester F15D EASY M 2015 or Proceq pull-off tester DY-225.

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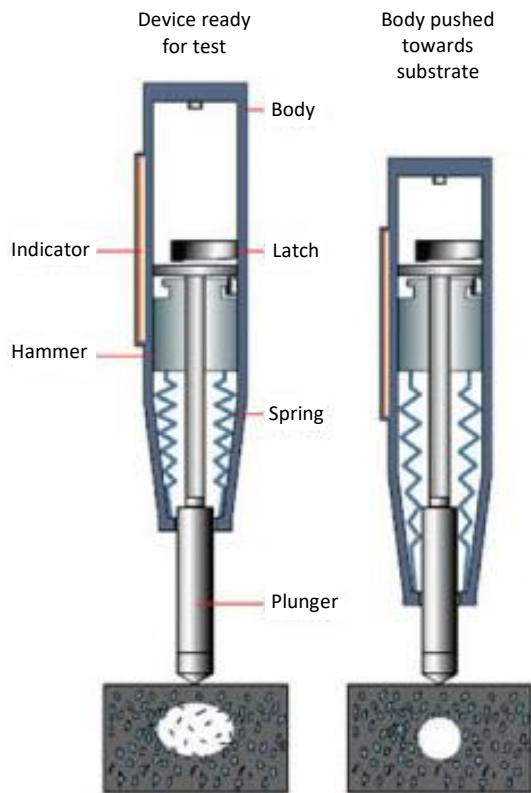
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3.2 COMPRESSIVE STRENGTH/ REBOUND HAMMER TEST



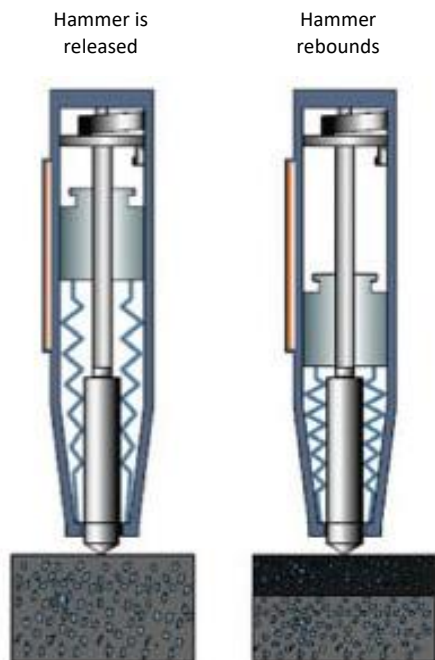
The commonly used non-destructive test to evaluate the compressive strength of concrete is the rebound hammer test according to EN 12504-2 “Determination of rebound number”.

It is based on measuring the surface hardness of the concrete and, as the response variable, has an index that can be used to estimate the resistance from correlation curves to assess the compressive strength of the structure (within $\pm 25\%$). The images on the left side shows that this test is based on the principle saying that the rebound of an elastic mass depends on the hardness of the surface against which the mass impinges.

The concrete substrate must be of sufficient compressive strength (minimum 25 N/mm^2).

A suitable device to carry out the measurement at the jobsite is a Schmidt’s Hammer e.g. from Proceq.

How do you use a Schmidt’s Hammer to measure the compressive strength?



- Remove hammer from case and press the end of the plunger against a hard surface to release the plunger from the locked position.
- Position the hammer vertically with end of the plunger against the concrete.
- Slowly apply pressure until the hammer fires. Do not press the lock button during this step.
- With the hammer still pressed against the concrete, read the rebound number off the scale provided on the hammer (indicator).

3.3 MOISTURE CONTENT

The maximum moisture content in concrete for the installation of Sika's resin based floor coverings is < 4% by weight.



Suitable devices, in order to carry out the measurement at the jobsite, are e.g. the **Sika Tramex moisture meter** or the **Calcium Carbide Method**, which provides more accurate readings in comparison.

The Sika Tramex is an instrument for measuring the moisture content instantly on concrete floors without the need to damage the surface. The electrodes, which are mounted on the base, transmit low-frequency signals to the concrete floor. The Sika Tramex compares the change in impedance caused by the presence of dampness and shows the moisture content in % by weight on the display.

How do you use a Calcium Carbide-Method to measure the moisture content?

A concrete sample from the concrete must be crushed with a hammer into as small pieces as possible.

- The crushed concrete sample, steel balls and one calcium carbide cartridge must be inserted into the steel bottle.
- The bottle is then closed with the manometer cap.
- The bottle must be shaken for a few minutes.
- Now starts the determination of water content from the gas pressure developed by the reaction of calcium carbide with the free water of the concrete.
- The gas pressure is measured with the precision manometer.
- On the calibrated scale of the pressure gauge the percentage of moisture in the concrete can be read.



Plastic sheet method according to ASTM D 4263

This standard test doesn't provide exact readings, but it is a very simple way to get an idea concerning the moisture content of the concrete.

All you have to do is:

- Place a piece of plastic foil (approx. 1 m²) on the floor.
- Fix it with tape.
- Wait 24 hrs.
- Check whether there is condensation underneath.
- If yes, this is an indication that the concrete contains moisture.

Consequence: Additional measuring with Sika Tramex, CM-Equipment or by use of the oven-dry-method is necessary.



4 AMBIENT CONDITIONS

4.1 AMBIENT AND SURFACE TEMPERATURE



The following can be measured e.g. with an Elcometer 309 Delta T Hygrometer:

- Relative humidity
- Ambient temperature
- Substrate temperature
- Dew Point

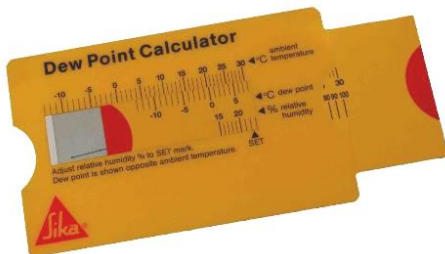
For product specific values please refer to the individual Product Data Sheet



Data Loggers allow the possibility to record continuous data over long periods.

Therefore the use of a data logger is highly recommended.

There are devices available which are able to measure temperature, air humidity, and the dew point.



The “Sika® Dew Point Calculator” is a helpful tool to check the dew point.

4.2 DEW POINT

“The dew point is the point at which a surface becomes wet due to condensation“.

If the temperature of the concrete substrate is below the dew point of the room, condensate forms on the concrete. This can have the following negative influence of the quality of a floor coating:

- Danger of cracking
- Poor adhesion
- Blistering or debonding
- Disturbance of the curing process
- Colour deviations

Rule of thumb: do not apply a resin based floor coating if the dew point is within (3° Kelvin) of the air temperature in the room. Please refer to the below displayed example in the dew point table:

| | 30.0 | 32.0 | 34.0 | 36.0 | 38.0 | 40.0 | 42.0 | 44.0 | 46.0 | 48.0 | 50.0 | 52.0 | 54.0 | 56.0 | 58.0 | 60.0 | 62.0 | 64.0 | 66.0 | 68.0 | 70.0 | 72.0 | 74.0 | 76.0 | 78.0 | 80.0 | 82.0 | 84.0 | 86.0 | 88.0 | 90.0 | 92.0 | 94.0 | 96.0 | 98.0 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 35.0 | 14.3 | 15.3 | 16.3 | 17.3 | 18.1 | 19.0 | 19.8 | 20.6 | 21.3 | 22.0 | 22.7 | 23.4 | 24.1 | 24.7 | 25.3 | 25.9 | 26.4 | 27.0 | 27.5 | 28.1 | 28.6 | 29.1 | 29.6 | 30.0 | 30.5 | 30.9 | 31.4 | 31.8 | 32.2 | 32.7 | 33.1 | 33.5 | 33.9 | 34.2 | 34.6 |
| 34.0 | 13.4 | 14.5 | 15.4 | 16.4 | 17.3 | 18.1 | 18.9 | 19.7 | 20.4 | 21.1 | 21.8 | 22.5 | 23.1 | 23.7 | 24.3 | 24.9 | 25.5 | 26.0 | 26.6 | 27.1 | 27.6 | 28.1 | 28.6 | 29.1 | 29.5 | 30.0 | 30.4 | 30.8 | 31.3 | 31.7 | 32.1 | 32.5 | 32.9 | 33.3 | 33.6 |
| 33.0 | 12.6 | 13.6 | 14.6 | 15.5 | 16.4 | 17.2 | 18.0 | 18.8 | 19.5 | 20.2 | 20.9 | 21.6 | 22.2 | 22.8 | 23.4 | 24.0 | 24.5 | 25.1 | 25.6 | 26.1 | 26.6 | 27.1 | 27.6 | 28.1 | 28.5 | 29.0 | 29.4 | 29.9 | 30.3 | 30.7 | 31.1 | 31.5 | 31.9 | 32.3 | 32.6 |
| 32.0 | 11.7 | 12.7 | 13.7 | 14.6 | 15.5 | 16.3 | 17.1 | 17.9 | 18.6 | 19.3 | 20.0 | 20.6 | 21.3 | 21.9 | 22.5 | 23.0 | 23.6 | 24.1 | 24.7 | 25.2 | 25.7 | 26.2 | 26.7 | 27.1 | 27.6 | 28.0 | 28.5 | 28.9 | 29.3 | 29.7 | 30.1 | 30.5 | 30.9 | 31.3 | 31.6 |
| 31.0 | 10.8 | 11.8 | 12.8 | 13.7 | 14.6 | 15.4 | 16.2 | 16.9 | 17.7 | 18.4 | 19.0 | 19.7 | 20.3 | 20.9 | 21.5 | 22.1 | 22.7 | 23.2 | 23.7 | 24.2 | 24.7 | 25.2 | 25.7 | 26.2 | 26.6 | 27.0 | 27.5 | 27.9 | 28.3 | 28.7 | 29.1 | 29.5 | 29.9 | 30.3 | 30.6 |
| 30.0 | 10.0 | 11.0 | 11.9 | 12.8 | 13.7 | 14.5 | 15.3 | 16.0 | 16.8 | 17.5 | 18.1 | 18.8 | 19.4 | 20.0 | 20.6 | 21.2 | 21.7 | 22.2 | 22.8 | 23.3 | 23.8 | 24.3 | 24.7 | 25.2 | 25.6 | 26.1 | 26.5 | 26.9 | 27.3 | 27.7 | 28.1 | 28.5 | 28.9 | 29.3 | 29.6 |
| 29.0 | 9.1 | 10.1 | 11.0 | 11.9 | 12.8 | 13.6 | 14.4 | 15.1 | 15.8 | 16.5 | 17.2 | 17.8 | 18.5 | 19.1 | 19.7 | 20.2 | 20.8 | 21.3 | 21.8 | 22.3 | 22.8 | 23.3 | 23.8 | 24.2 | 24.7 | 25.1 | 25.5 | 25.9 | 26.4 | 26.8 | 27.1 | 27.5 | 27.9 | 28.3 | 28.6 |
| 28.0 | 8.2 | 9.2 | 10.1 | 11.0 | 11.9 | 12.7 | 13.5 | 14.2 | 14.9 | 15.6 | 16.3 | 16.9 | 17.5 | 18.1 | 18.7 | 19.3 | 19.8 | 20.3 | 20.9 | 21.4 | 21.9 | 22.3 | 22.8 | 23.2 | 23.7 | 24.1 | 24.5 | 25.0 | 25.4 | 25.8 | 26.2 | 26.5 | 26.9 | 27.3 | 27.6 |
| 27.0 | 7.3 | 8.3 | 9.3 | 10.1 | 11.0 | 11.8 | 12.6 | 13.3 | 14.0 | 14.7 | 15.4 | 16.0 | 16.6 | 17.2 | 17.8 | 18.3 | 18.9 | 19.4 | 19.9 | 20.4 | 20.9 | 21.4 | 21.8 | 22.3 | 22.7 | 23.1 | 23.6 | 24.0 | 24.4 | 24.8 | 25.2 | 25.5 | 25.9 | 26.3 | 26.6 |
| 26.0 | 6.5 | 7.4 | 8.4 | 9.3 | 10.1 | 10.9 | 11.7 | 12.4 | 13.1 | 13.8 | 14.4 | 15.1 | 15.7 | 16.3 | 16.8 | 17.4 | 17.9 | 18.4 | 19.0 | 19.5 | 19.9 | 20.4 | 20.9 | 21.3 | 21.7 | 22.2 | 22.6 | 23.0 | 23.4 | 23.8 | 24.2 | 24.6 | 24.9 | 25.3 | 25.6 |
| 25.0 | 5.6 | 6.6 | 7.5 | 8.4 | 9.2 | 10.0 | 10.8 | 11.5 | 12.2 | 12.9 | 13.5 | 14.1 | 14.7 | 15.3 | 15.9 | 16.4 | 17.0 | 17.5 | 18.0 | 18.5 | 19.0 | 19.4 | 19.9 | 20.3 | 20.8 | 21.2 | 21.6 | 22.0 | 22.4 | 22.8 | 23.2 | 23.6 | 23.9 | 24.3 | 24.7 |
| 24.0 | 4.7 | 5.7 | 6.6 | 7.5 | 8.3 | 9.1 | 9.8 | 10.6 | 11.3 | 11.9 | 12.6 | 13.2 | 13.8 | 14.4 | 15.0 | 15.5 | 16.0 | 16.5 | 17.0 | 17.5 | 18.0 | 18.5 | 18.9 | 19.4 | 19.8 | 20.2 | 20.6 | 21.0 | 21.4 | 21.8 | 22.2 | 22.6 | 22.9 | 23.3 | 23.7 |
| 23.0 | 3.8 | 4.8 | 5.7 | 6.6 | 7.4 | 8.2 | 8.9 | 9.7 | 10.4 | 11.0 | 11.7 | 12.3 | 12.9 | 13.5 | 14.0 | 14.6 | 15.1 | 15.6 | 16.1 | 16.6 | 17.1 | 17.5 | 18.0 | 18.4 | 18.8 | 19.3 | 19.7 | 20.1 | 20.5 | 20.8 | 21.2 | 21.6 | 22.0 | 22.3 | 22.7 |
| 22.0 | 3.0 | 3.9 | 4.8 | 5.7 | 6.5 | 7.3 | 8.0 | 8.7 | 9.4 | 10.1 | 10.7 | 11.3 | 11.9 | 12.5 | 13.1 | 13.6 | 14.1 | 14.6 | 15.1 | 15.6 | 16.1 | 16.6 | 17.0 | 17.4 | 17.9 | 18.3 | 18.7 | 19.1 | 19.5 | 19.9 | 20.2 | 20.6 | 21.0 | 21.3 | 21.7 |
| 21.0 | 2.1 | 3.0 | 3.9 | 4.8 | 5.6 | 6.4 | 7.1 | 7.8 | 8.5 | 9.2 | 9.8 | 10.4 | 11.0 | 11.6 | 12.1 | 12.7 | 13.2 | 13.7 | 14.2 | 14.7 | 15.1 | 15.6 | 16.0 | 16.5 | 16.9 | 17.3 | 17.7 | 18.1 | 18.5 | 18.9 | 19.2 | 19.6 | 20.0 | 20.3 | 20.7 |
| 20.0 | 1.2 | 2.2 | 3.1 | 3.9 | 4.7 | 5.5 | 6.2 | 6.9 | 7.6 | 8.3 | 8.9 | 9.5 | 10.1 | 10.6 | 11.2 | 11.7 | 12.2 | 12.7 | 13.2 | 13.7 | 14.2 | 14.6 | 15.1 | 15.5 | 15.9 | 16.3 | 16.7 | 17.1 | 17.5 | 17.9 | 18.3 | 18.6 | 19.0 | 19.3 | 19.7 |
| 19.0 | 0.3 | 1.3 | 2.2 | 3.0 | 3.8 | 4.6 | 5.3 | 6.0 | 6.7 | 7.3 | 8.0 | 8.6 | 9.1 | 9.7 | 10.3 | 10.8 | 11.3 | 11.8 | 12.3 | 12.8 | 13.2 | 13.7 | 14.1 | 14.5 | 14.9 | 15.4 | 15.8 | 16.1 | 16.5 | 16.9 | 17.3 | 17.6 | 18.0 | 18.3 | 18.7 |
| 18.0 | | 0.4 | 1.3 | 2.1 | 2.9 | 3.7 | 4.4 | 5.1 | 5.8 | 6.4 | 7.0 | 7.6 | 8.2 | 8.8 | 9.3 | 9.8 | 10.3 | 10.8 | 11.3 | 11.8 | 12.3 | 12.7 | 13.1 | 13.6 | 14.0 | 14.4 | 14.8 | 15.2 | 15.5 | 15.9 | 16.3 | 16.6 | 17.0 | 17.3 | 17.7 |
| 17.0 | | | 0.4 | 1.2 | 2.0 | 2.8 | 3.5 | 4.2 | 4.8 | 5.5 | 6.1 | 6.7 | 7.3 | 7.8 | 8.4 | 8.9 | 9.4 | 9.9 | 10.4 | 10.8 | 11.3 | 11.7 | 12.2 | 12.6 | 13.0 | 13.4 | 13.8 | 14.2 | 14.6 | 14.9 | 15.3 | 15.6 | 16.0 | 16.3 | 16.7 |
| 16.0 | | | | 0.3 | 1.1 | 1.9 | 2.6 | 3.3 | 3.9 | 4.6 | 5.2 | 5.8 | 6.3 | 6.9 | 7.4 | 7.9 | 8.4 | 8.9 | 9.4 | 9.9 | 10.3 | 10.8 | 11.2 | 11.6 | 12.0 | 12.4 | 12.8 | 13.2 | 13.6 | 13.9 | 14.3 | 14.7 | 15.0 | 15.3 | 15.7 |
| 15.0 | | | | | 0.2 | 1.0 | 1.7 | 2.4 | 3.0 | 3.6 | 4.3 | 4.8 | 5.4 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 8.9 | 9.4 | 9.8 | 10.2 | 10.6 | 11.1 | 11.4 | 11.8 | 12.2 | 12.6 | 13.0 | 13.3 | 13.7 | 14.0 | 14.3 | 14.7 |
| 14.0 | | | | | | 0.1 | 0.8 | 1.4 | 2.1 | 2.7 | 3.3 | 3.9 | 4.5 | 5.0 | 5.5 | 6.1 | 6.6 | 7.0 | 7.5 | 8.0 | 8.4 | 8.8 | 9.3 | 9.7 | 10.1 | 10.5 | 10.9 | 11.2 | 11.6 | 12.0 | 12.3 | 12.7 | 13.0 | 13.3 | 13.7 |
| 13.0 | | | | | | | 0.5 | 1.2 | 1.8 | 2.4 | 3.0 | 3.5 | 4.1 | 4.6 | 5.1 | 5.6 | 6.1 | 6.5 | 7.0 | 7.4 | 7.9 | 8.3 | 8.7 | 9.1 | 9.5 | 9.9 | 10.3 | 10.6 | 11.0 | 11.3 | 11.7 | 12.0 | 12.4 | 12.7 | |
| 12.0 | | | | | | | | 0.3 | 0.9 | 1.5 | 2.0 | 2.6 | 3.1 | 3.7 | 4.2 | 4.7 | 5.1 | 5.6 | 6.0 | 6.5 | 6.9 | 7.3 | 7.7 | 8.1 | 8.5 | 8.9 | 9.3 | 9.6 | 10.0 | 10.3 | 10.7 | 11.0 | 11.4 | 11.7 | |
| 11.0 | | | | | | | | | 0.5 | 1.1 | 1.7 | 2.2 | 2.7 | 3.2 | 3.7 | 4.2 | 4.6 | 5.1 | 5.5 | 5.9 | 6.4 | 6.8 | 7.2 | 7.5 | 7.9 | 8.3 | 8.7 | 9.0 | 9.4 | 9.7 | 10.0 | 10.4 | 10.7 | | |
| 10.0 | | | | | | | | | | 0.2 | 0.7 | 1.3 | 1.8 | 2.3 | 2.8 | 3.2 | 3.7 | 4.1 | 4.6 | 5.0 | 5.4 | 5.8 | 6.2 | 6.6 | 6.9 | 7.3 | 7.7 | 8.0 | 8.4 | 8.7 | 9.0 | 9.4 | 9.7 | | |

Example:

An air temperature of **+15°C** and a relative air moisture of **80%** is the dew point is **+11.4°C**.

At substrate temperatures of less than **+11.4°C + 3°K = +14.4°C**, it is not permitted to apply coating systems.



4.3 SUBSTRATE TEMPERATURE



Substrate temperature $> +10^{\circ}\text{C}$.
The substrate temperature has to be measured continuously during application.

4.4 AMBIENT TEMPERATURE



Ambient temperature below $+30^{\circ}\text{C}$

Note: The speed of any chemical reaction is dependent on temperature. As a general rule, the higher the temperature, the more rapid the reaction.

4.5 RELATIVE AIR HUMIDITY



Relative air humidity max. 80%

Beware of condensation!
The substrate must be at least 3°K above dew point.

5 SUBSTRATE PREPARATION

Concrete substrates must be mechanically prepared in order to remove cement laitance, existing coatings and achieve a gripping profile that is clean, dry and free from laitance, dirt, grease, oil and any other form of surface contamination. Vacuum blasting or similar techniques are ideally suited.

High spots must be removed by e.g. grinding.

All dust, loose and friable material must be completely removed from all surfaces before application of the product, preferably by vacuum.

Weak concrete must be removed, and surface defects such as blowholes and voids must be fully exposed.

Repairs to the substrate, filling of blowholes / voids and surface levelling must be carried out using appropriate products from the Sikafloor®, and Sikadur® range of materials. The concrete or screed substrate has to be primed or levelled in order to achieve an even surface.

The selected method of preparation will depend on the surface condition, environmental constraints and availability of services. The method may be selected on the basis of trial areas, approved by the Contract Administrator.



Preparation of the substrate:

Blast cleaning or other mechanical means. e.g. Blastrac, HTC or similar.

Professional equipment is required to achieve a functioning floor, such as: Scarifier, Grinder, Bush-Hammer Equipment, Vacuum Shot Blaster, Vacuum Cleaner and equivalent.

5.1 SCARIFICATION



Scarifying concrete

Scarifying is a well-known method, used over years in order to level a floor, to prepare a concrete floor for further treatment, or to remove old resin based coating, to achieve a profiled open textured surface.

A concrete scarifier is equipped with a rotating, cutting tool that rotates at a very high speed and tears the surface apart. Scarifying creates a lot of dust. Therefore, a sufficiently dimensioned vacuum cleaner has to be connected to the scarifier.

On the other hand, scarifying can cause small cracks to appear in the surface. The upper layer of the concrete as well as the aggregates of the concrete can thus be loosened. It is therefore essential that after scarifying the prepared concrete surface is additionally shot-blasted or bush-hammered.

5.2 GRINDING



Surface grinders with diamond grinding tools are used to remove high spots on a concrete surface such as removing coatings, mastics, urethane, epoxy, paint and other surface contaminants. Grinding with diamond tools creates a lot of dust; therefore capable dust collection method must be used. **Please note:** Do not use grinding pads out of hard aggregates such as aluminium oxide (corundum). These pads only polishing the concrete surface and are not suitable to generate a certain roughness.

5.3 BUSH-HAMMERING

The bush hammer was an invention of the French sculptor Henri Bouchard (1875 - 1960) and was actually used as a masonry tool to texturize stone and concrete. The principle of bush-hammering is to use impact tools in order to remove cement laitance or poorly adhering cement paste at a concrete surface. The amount of surface removal can vary significantly, depending on the application and on the compressive strength of the concrete substrate. Modern bush-hammer equipment is based on walk-behind, electrically operated grinding machines, which are additionally equipped with powerful vacuum cleaners. With such machines surface roughness from CSP 3 to CSP 7 can be achieved.



5.4 VACUUM SHOT BLASTING



Vacuum Shot Blasting is the industry standard for surface preparation of concrete.

Vacuum Shot Blasting means that a machine projects a large number of abrasives towards the surface of the concrete and this way roughens the surface. A wheel in the machine uses centrifugal force to propel the abrasive against the concrete.

The abrasives are then drawn back into the machine to be used again. The dust will be separated by the use of a dust collector.

5.5 VACUUM CLEANING OF THE PREPARED SURFACE



Dust, loose and friable materials must be completely removed from all surfaces before applying the product, preferably with a broom and a powerful industrial vacuum cleaner.



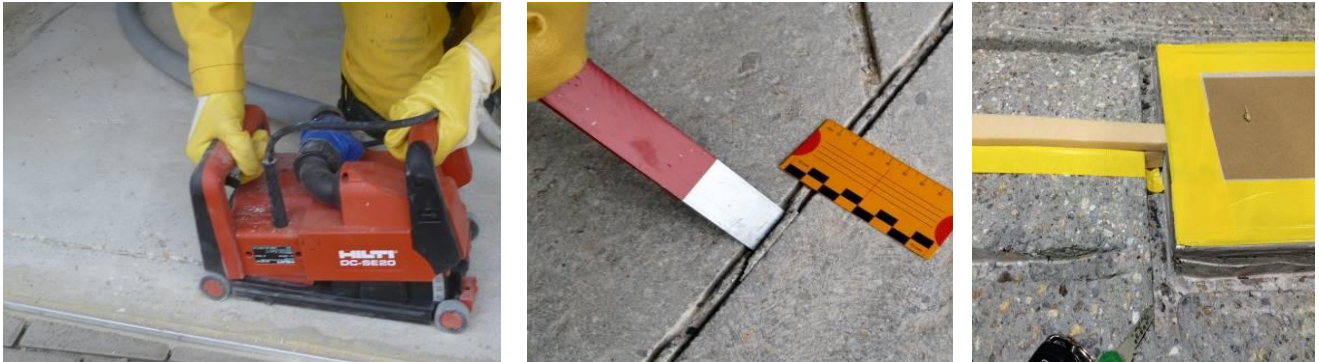
The surface must be clean, dry and free of all contaminants, e.g. dirt, oils, grease, coatings and surface treatments, etc.



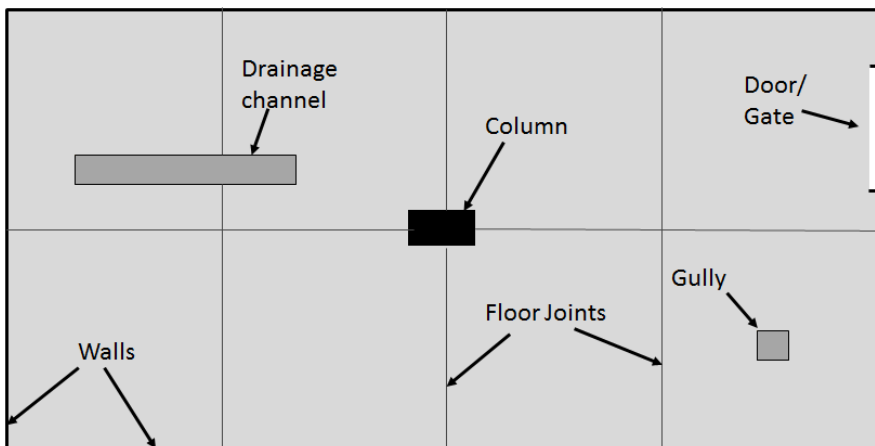
Substrate defects, such as cracks, blow holes and voids must be repaired using appropriate products from the Sika® MonoTop®, Sikafloor®, or Sikadur® range.

5.6 HOW TO CUT ANCHOR GROOVES FOR PRODUCTS WITHIN THE SIKAFLOOR® PURCEM® RANGE

All free edges and working day joints of products within the Sikafloor® PurCem® range, whether at the perimeter, along gutters or at drains require extra anchorage to distribute mechanical and thermal stresses. This is best achieved by forming or cutting grooves in the concrete. Use a suitable double blade saw, fitted with diamond cutting disks, which is connection to an industrial vacuum cleaner.



Before cutting the anchor grooves:

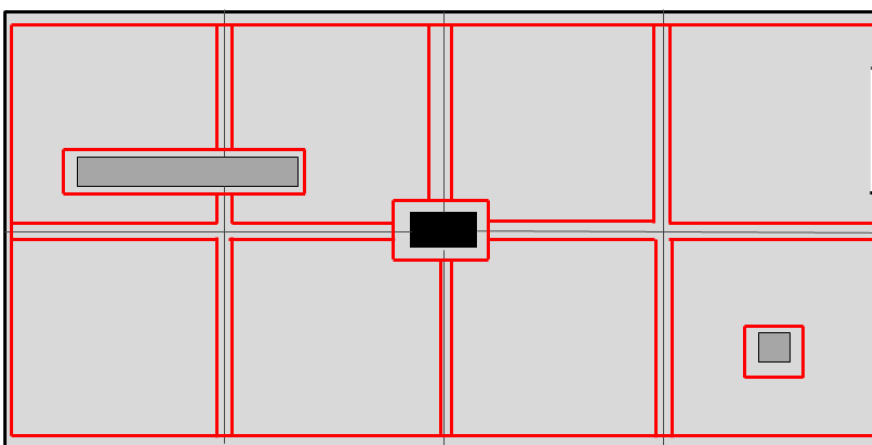


Grooves must have a depth and width of twice the thickness of the Sikafloor® PurCem® product.

Retaining grooves must be opened to prevent curling of the screed during hardening and curing.

The retaining grooves must be located in the perimeter of the application area, around columns, plinths, drains or any singular element that represents a discontinuity in the screed.

After cutting the anchor grooves:



They must also be carried out as day joints at the end of each application.

Placing:

- Max 5 - 8 cm from the edge
- Drains and “free edges” directly at the finish point

5.7 MEASURING THE DEPTH OF ROUGHNESS

The measuring of the depth of roughness serves the regulation of the average roughness on a horizontal surface. In order to achieve a sufficient total system thickness a maximum surface roughness S_r of 1.5 mm should not be exceeded. If the surface roughness S_r is > 1.5 mm a levelling- or scratch coat has to be applied. The examination has to be executed after the surface preparation.

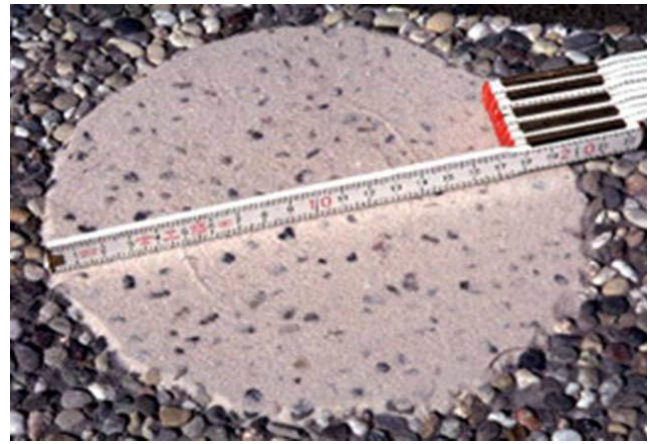
The average surface roughness (S_r) is defined as height of an assumed cylinder with the diameter (d) and the sand volume (V).

Following tools and aids are necessary:

- Defined Volume V (50 cm³)
- Dried kiln quartz sand 0.1 - 0.3 mm
- Round wooden disc (Ø 50 mm, thickness 10 mm)
- Pocket rule



A defined sand quantity (volume V) has to be distributed onto the surface in a circular manner so that all deepenings are filled exactly with quartz sand.



Measuring of the diameter with a pocket rule.

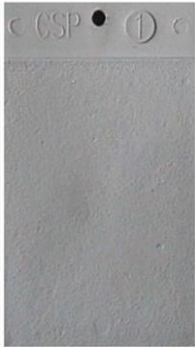
$$\text{Formula: } S_r = \frac{V \times 4}{\pi \times d^2} \times 10$$

Calculation of the surface roughness depending on the size of the diameter of the circle:

| | | | | | | | | |
|-------------------------|------|------|------|------|------|------|------|------|
| Ø of circle [cm]: | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| Surface roughness [mm]: | 6.40 | 2.83 | 1.59 | 1.02 | 0.71 | 0.52 | 0.40 | 0.31 |

5.8 CONCRETE SURFACE PROFILE

The International Concrete Repair Institute (ICRI) has defined ten different guidelines for proper surface preparation and has developed profile replica blocks to give a visual point of reference for the user. The ten profile replicas of the CSP standards can be obtained from ICRI. Each profile carries a CSP number ranging from a base line of 1 (nearly flat) through 10 (very rough). CSP-10 has been added to reflect a more aggressive CSP used for concrete repair. Sika's recommendation: Concrete has to be prepared to achieve a laitance-free and contaminant-free, open textured surface e.g. by shot blasting, bush hammering, or equivalent mechanical means (CSP-3 to CSP-4 as per ICRI guidelines).



CSP-1:
Acid Etched, brushing*



CSP-2:
Grinding



CSP-3:
Light Shot Blast/ Bush-hammering



CSP-4:
Light/medium shotblast light scarification/ Bush-hammering



CSP-5:
Medium Shot Blast / Bush-hammering



CSP-6:
Medium Scarification



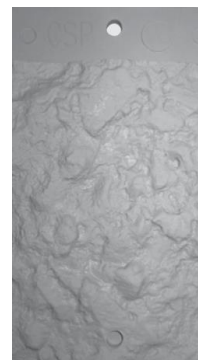
CSP-7:
Heavy Abrasive Blast



CSP-8:
Scabbled



CSP-9:
Heavy Scarification



CSP-10
Hand held concrete blaster followed by abrasive blasting

* Sika does not recommend acid etching! Please refer to "Limitations".

METHOD SELECTOR:

| Preparation method | Concrete Surface Profile | | | | | | | | | |
|--------------------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | CSP-1 | CSP-2 | CSP-3 | CSP-4 | CSP-5 | CSP-6 | CSP-7 | CSP-8 | CSP-9 | CSP-10 |
| Low-pressure water cleaning | | | | | | | | | | |
| Grinding | | | | | | | | | | |
| Abrasive (sand) blasting | | | | | | | | | | |
| Abrasive blasting | | | | | | | | | | |
| Bush-hammering / Scabbling | | | | | | | | | | |
| Scarifying | | | | | | | | | | |
| Concrete blaster & abrasive blasting | | | | | | | | | | |

Method Statement

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Language/Region/Translation

e.g. template for local adaption

6 LIMITATIONS

- Beware of condensation! The substrate must be at least +3°K above dew point.
- At moisture of concrete of > 4% pbw the application of a temporary moisture barrier with Sikafloor®-81 EpoCem is mandatory (please refer to Sikafloor®-81 EpoCem Product Data Sheet).
- For the acid etching of concrete, chemicals like hydrochloric acid, phosphoric acid, or sulphamic acid are used to prepare the substrate. Due to risk of not leaving sufficient neutralised concrete after acid etching, and because of H&S risks, and ecological reasons, Sika does not recommend acid etching!
- Do not use grinding pads out of hard aggregates such as aluminium oxide (corundum). These pads only polish the concrete surface and are not suitable to generate a certain roughness.

7 HEALTH AND SAFETY RECOMMENDATIONS

For information and advice on the safe handling, storage and disposal of chemical products, users shall refer to the most recent Material Safety Data Sheet containing physical, ecological, toxicological and other safety-related data.

8 LEGAL NOTE

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the products suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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